This repreſents a ſegment of iron ſixty feet long, eight inches broad by four thick, and may be conſidered as a ſingle ſtone of that length; which being placed between butments and the ſpring, preſerved in a perpendicular direction, let five weights be ſuſpended at equal diſtance; and, in all probability, though each weight amounted to twenty tons, it would ſupport the whole five equal to one hundred tons: yet, let one weight of twenty tons be ſuſpended between the centre and end, as in Fig. II. and it is reaſonable to ſuppoſe, the whole would come to the ground, as the weight would compreſs one part and raiſe the other, deſtroying the ſhape of the ſegment, and preventing the direct longitudinal preſſure of the parts on each other, for want of counter-weights to preſerve the equilibrium. Therefore, after forming a ſegment, the great point is to diſpoſe of the braces, ſo as to divide the weights equally on the curve.

To effect this, Fig. III. repreſents a ſpan of one hundred and thirty feet, by a ſcale of one inch to twenty feet; and is an arrangement of parts which, I conceive, would ſtand without butments, this may be conſidered as a bow and ſtring; which ſtring, by keeping the bow bent, anſwers the purpoſe of butments; all the other braces being for the purpoſe of preſerving the bow and ſtring in their proper ſituation, by dividing the weight on the bow. For inſtance, a weight over the perpendicular B, will tend to extend 1, and 2; in which caſe, they paſs on A and C, and they pull down the bow at F and G; F and G, by the ſame ſyſtem, pull down H and I, and ſo on, wherever the weight is placed its preſſure will be divided along the bow, which conſequently cannot vary its poſition: according to the width of the bridge required, four or more of ſuch ribs muſt be conſtructed and placed perhaps ten feet diſtant from each other; the whole being faſtened by